

## *CABLE, FRENCH ATLANTIC*

### History of the Atlantic Cable & Submarine Telegraphy

#### *The French Atlantic Cable: Brest - Duxbury, 1869*

France laid its first submarine cable in 1869, between Doléon, near Brest on the western tip of the mainland, and the islands of Saint-Pierre et Miquelon, off Newfoundland, Canada, with an extension to Duxbury, Massachusetts.

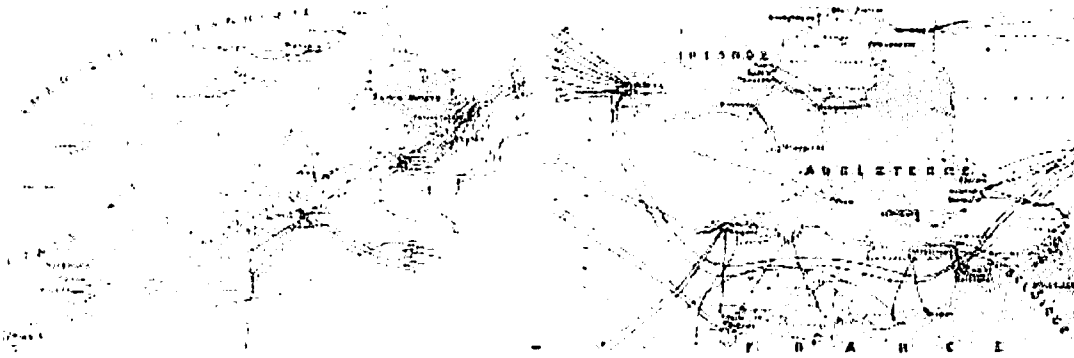
Duxbury was incorporated in 1637. Situated 33 miles south of Boston and 246 miles from New York City, the town is set at the head of Plymouth Bay "in a lovely undulating landscape washed by a beautiful sheet of water". [1]

A center of shipbuilding until the mid-nineteenth century, when ships became too large for the shallow bay, Duxbury achieved a measure of fame as the landing site for the third Atlantic Cable. This 1869 French cable was the beginning of the second period of long-distance submarine cable laying, when the art had advanced beyond the experimental and satisfactory results were likely. A contemporary review of the decade of the 1860s illustrates this [2]:

The failure to lay down an Atlantic telegraph in the last previous decade (1858) had indisposed men to undertakings so vast in every sense, and so doubtful in every way. Some years passed before the attempt was renewed, but the genius and energy of our countryman, Mr. Cyrus W. Field, finally cleared all difficulties away, after repeated failures; and in 1866 the Atlantic Telegraph became an accomplished fact, just in time to furnish the news of the closing events of the Germano-Italian war. A cable that had previously been lost was recovered, and two lines thus existed between Europe and America.

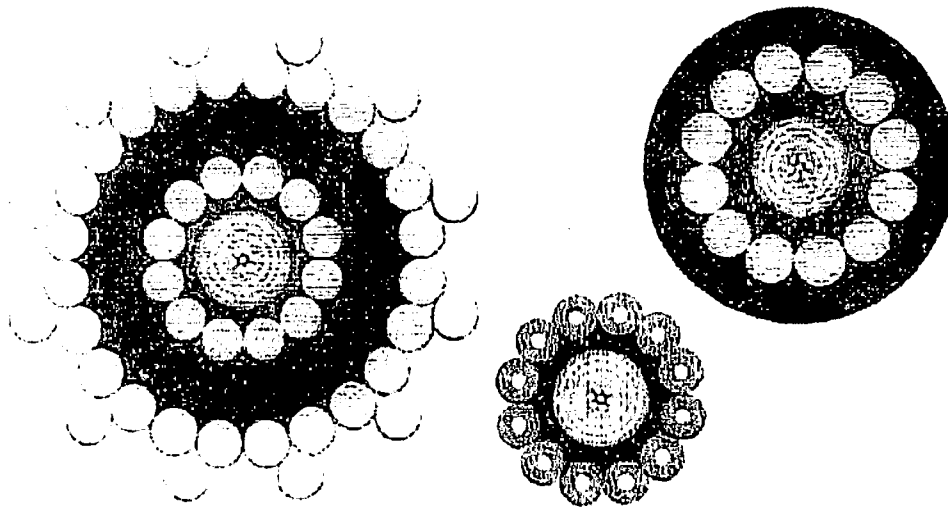
In 1869 the French cable was laid, connecting Brest with Duxbury (Massachusetts). The great problem had been solved in 1866, and for more than four years daily communication between the Old World and the New has taken place. The telegraph has been extended to India, and there is now communication through its existence between San Francisco and Calcutta.

These great enterprises all belong to the seventh decade of the century; and others are in progress which will bring India in connection with Australia, and the extremities of Eastern Asia with those of Western America.



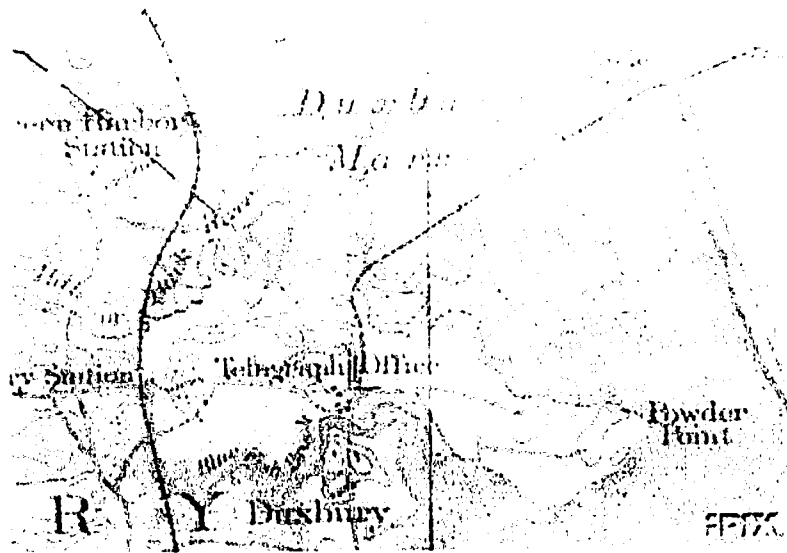
These cable maps, published by the International Telegraph Bureau, Bern, in 1897, show the 1869 cable route from Brest to St. Pierre & Miquelon, continuing to Sydney and Duxbury. The maps also show eleven further transatlantic cables laid between 1869 and 1897, evidence of the rapid development of the cable network in the three decades following the laying of the French cable [3].

Julius Reuter, of the famous news agency, and Baron Emil d'Erlanger were the promoters of *La Société du Câble Transatlantique Française*; this company gave the contract to manufacture and lay the cable to Telcon, the Telegraph and Maintenance Construction Company, of London. Telcon manufactured the Brest to St. Pierre section of the cable, and subcontracted W.T. Henley to make the St. Pierre to Sydney length.



The illustration shows the three weights of cable used. All had an identical core of 7 copper strands. On the left is the shore-end cable, heavily armoured to resist damage from rocks and ships' anchors. On the right is the intermediate cable, used to run from the shallows near shore out to deeper water. In the center is the deep-sea cable, the main length of the run, and having the lightest armouring. The diagrams are to scale; the deep-sea cable is about 1" diameter.

The cable was laid by the *Great Eastern*, with the *Hawk* (laid the European shore end), *Robert Lowe* (landed the St. Pierre shore end), *Chiltern*, *Scanderia*, and William Cory (laid and landed the Sydney and Duxbury extensions)[4].



1885 map of Duxbury showing the cable station and the cable laid across the marsh

The *Great Eastern* had bankrupted a series of owners, but had successfully laid the 1866 cable from Ireland to Newfoundland. After this, though, the ship languished for lack of work. This article appeared in *Scientific American* in April 1868 [5]:

### An "Elephant" Indeed

The owners of the *Great Eastern*, mourning not simply a non-appearance of dividends, but a very heavy expense in keeping the big ship in existence, are in a sad state of perplexity, not knowing what is to become of their unproductive property. At the late annual meeting of the shareholders, the directors' report deplored the failure of the company to complete its contract with the new French cable company, the latter refusing to act up to the terms of the agreement, and the whole affair is now before the law courts for adjudication. As far as the future was concerned, the chairman tried to persuade the company that the prospects were encouraging as there were other cables to be laid and he was certain that their ship was the only one which could accomplish such an undertaking successfully. One hopeful proprietor suggested that the *Leviathan* should be converted into an immense floating hotel, but the plan was promptly voted down. The shareholders are certainly deserving of public sympathy.

The difficulty with the French cable company was apparently resolved, as just over a year later, on 17 July 1869, *Scientific American* reported [6]:

The work of constructing the telegraph line from Boston to Duxbury, Mass., to connect with the new French cable, was begun on the 19th of June.

British engineer Fleeming Jenkin noted in his memoirs [7]:

'JUNE 17, 1869. - Here are the names of our staff in whom I expect you to be interested, as future GREAT EASTERN stories may be full of them: Theophilus Smith, a man of Latimer Clark's; Leslie C. Hill, my prizeman at University College; Lord Sackville Cecil; King, one of the Thomsonian Kings; Laws, goes for Willoughby Smith, who will also be on board; Varley, Clark, and Sir James Anderson make up the sum of all you know anything of. A Captain Halpin commands the big ship. There are four smaller vessels. The WM. CORY, which laid the Norderney cable, has already gone to St. Pierre to lay the shore ends. The HAWK and CHILTERN have gone to Brest to lay shore ends. The HAWK and SCANDERIA go with us across the Atlantic and we shall at St. Pierre be transhipped into one or the other.

'JUNE 18. SOMEWHERE IN LONDON. - The shore end is laid, as you may have seen, and we are all under pressing orders to march, so we start from London to-night at 5.10.

'June 20. OFF USHANT. - I am getting quite fond of the big ship. Yesterday morning in the quiet sunlight, she turned so slowly and lazily in the great harbour at Portland, and bye and bye slipped out past the long pier with so little stir, that I could hardly believe we were really off. No men drunk, no women crying, no singing or swearing, no confusion or bustle on deck - nobody apparently aware that they had anything to do. The look of the thing was that the ship had been spoken to civilly and had kindly undertaken to do everything that was necessary without any further interference. I have a nice cabin with plenty of room for my legs in my berth and have slept two nights like a top. Then we have the ladies' cabin set apart as an engineer's office, and I think this decidedly the nicest place in the ship: 35 ft. x 20 ft. broad - four tables, three great mirrors, plenty of air and no heat from the funnels which spoil the great dining-room. I saw a whole library of books on the walls when here last, and this made me less anxious to provide light literature; but alas, to-day I find that they are every one bibles or prayer-books. Now one cannot read many hundred bibles. . . . As for the motion of the ship it is not very much, but 'twill suffice. Thomson shook hands and wished me well. I DO like Thomson. . . . Tell Austin that the GREAT EASTERN has six masts and four funnels. When I get back I will make a little model of her for all the chicks and pay out cotton reels. . .

Here we are at 4.20 at Brest. We leave probably to-morrow morning.

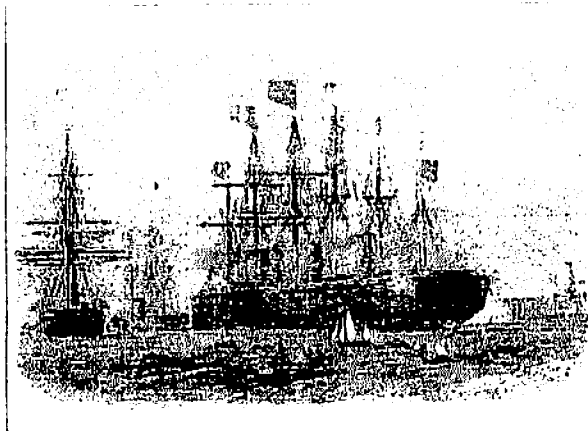
'JULY 12. GREAT EASTERN. - Here as I write we run our last course for the buoy at the St. Pierre shore end. It blows and lightens, and our good ship rolls, and buoys are hard to find; but we must soon now finish our work, and then this letter will start for home. . . . Yesterday we were mournfully groping our way through the wet grey fog, not at all sure where we were, with one consort lost and the other faintly answering the roar of our great whistle through the mist. As to the ship which was to meet us, and pioneer us up the deep channel, we did not know if we should come within twenty miles of her; when suddenly up went the fog, out came the sun, and there,

straight ahead, was the WM. CORY, our pioneer, and a little dancing boat, the GULNARE, sending signals of welcome with many-coloured flags. Since then we have been steaming in a grand procession; but now at 2 A.M. the fog has fallen, and the great roaring whistle calls up the distant answering notes all around us. Shall we, or shall we not find the buoy?

'JULY 13. - All yesterday we lay in the damp dripping fog, with whistles all round and guns firing so that we might not bump up against one another. This little delay has let us get our reports into tolerable order. We are now at 7 o'clock getting the cable end again, with the main cable buoy close to us.'

A TELEGRAM OF JULY 20: 'I have received your four welcome letters. The Americans are charming people.'

Willoughby Smith, in his book "The Rise and Extension of Submarine Telegraphy" [8] gives a detailed account of the cable laying by *Great Eastern*, the voyage beginning off the coast of France on 21 June 1869. The ship was captained by Robert Halpin, and on board was an assemblage of many famous cable men, including Sir James Anderson (captain of the *Great Eastern* on its previous Atlantic Cable voyages), Sir Daniel Gooch, Willoughby Smith, Latimer Clark, Fleeming Jenkin, and C.F. Varley, among others. William Thomson (Lord Kelvin) was at the cable station in Brest making measurements between ship and shore as the cable was laid.



The Great Eastern Steam-Ship Leaving Sheerness  
With The French Atlantic Cable  
(The Illustrated London News, June 26, 1869)

The cable was landed at St. Pierre, off the coast of Newfoundland, on 13 July 1869. This was the end of *Great Eastern*'s involvement in this cable, but not the end of the cable. From St. Pierre two cables were run; one to Sydney, Nova Scotia, the other to Duxbury.

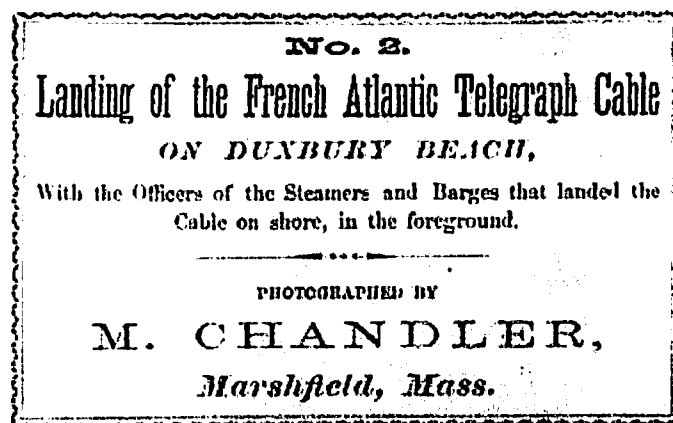
Smith was unwell, and went back to England on *Great Eastern*, but he reports the landing of the cable in Duxbury. The ships involved in this last part of the expedition were the *Chiltern*, *Scanderia*, and William Cory:

Friday, July 23rd. The deep sea portion of the cable was completed off Cape Cod at

11.20 a.m. The splice was then made between deep sea and intermediate portions, and at 12.45 we commenced paying out again.

After paying out the thirty-one knots of intermediate cable we commenced on the heavy shore end (4.45 p.m.), and at 6.30 we had arrived at our anchorage opposite the landing place. The hands at once commenced to coil the end into a boat, and in about three hours the end was conducted into the cable house on shore.

Photographer Martin Chandler recorded the cable landing in a small series of stereoviews, four of which are illustrated in this article. Chandler's business location is listed on the back of the cards as Marshfield, Massachusetts, immediately to the north of Duxbury.

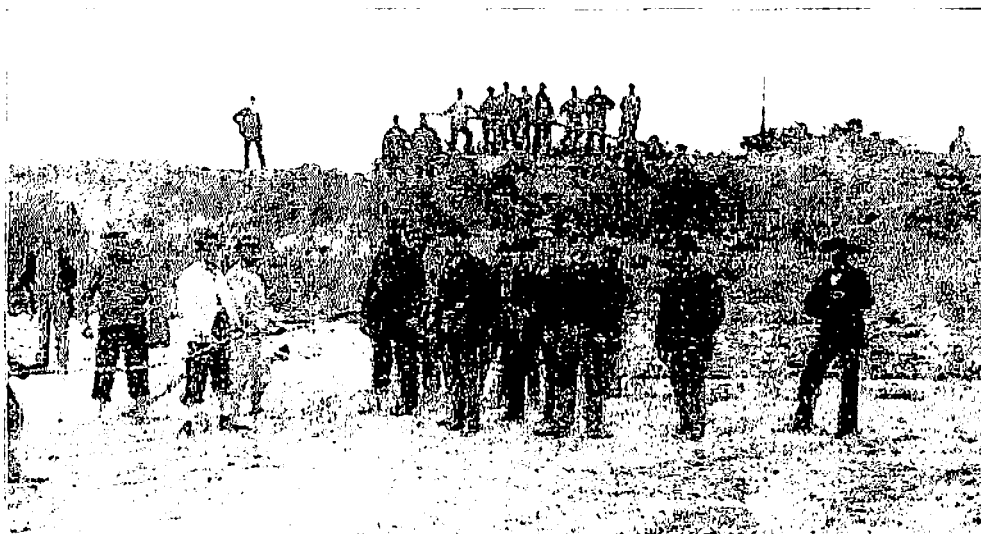


Listed initially as a daguerreian, Chandler later took stereo views, and remained in business in Marshfield until 1896.

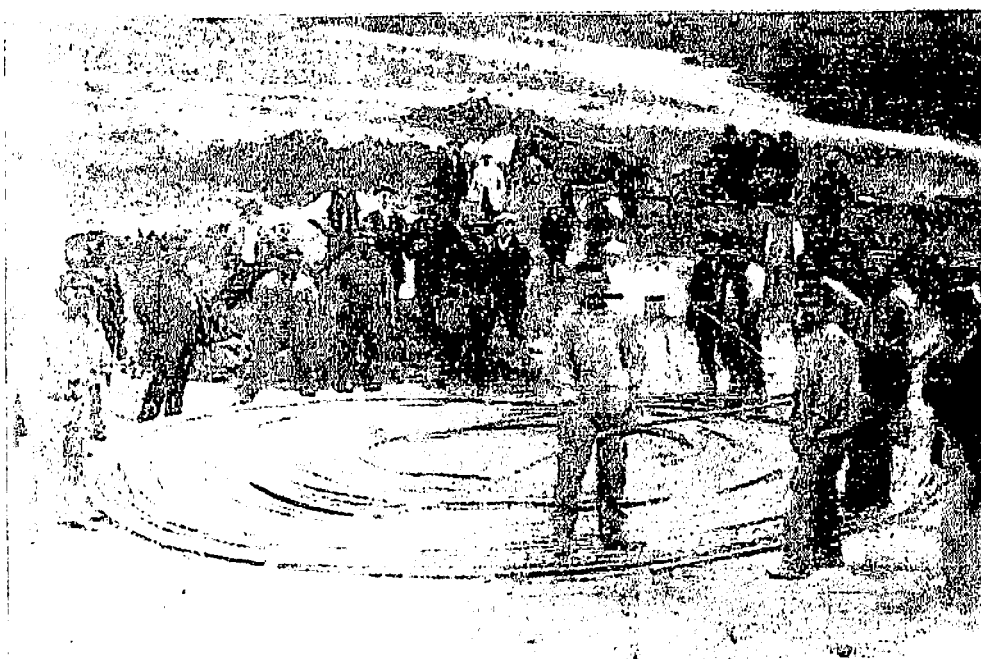
According to information received in May 2003 from Harry Chandler (Martin's brother's great-great-grandson), Martin Chandler died in Marshfield in 1897. The Marshfield Historical Commission has many of Chandler's photographs (including one of his wagon and photographic equipment) and reprints of his photographs hang in the Marshfield Town Hall.



[Click on picture for larger image](#), [click here for stereoview](#)



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Stereoviews courtesy of the Ken Rosen Image Archive

On 7 August 1869, *Scientific American* reported the successful completion of the cable [9]:

### The French Cable Laid

The French Atlantic Cable has been successfully laid, making in all, three cables which have been stretched between the Eastern and Western hemispheres. The Great Eastern has proved herself especially useful in the laying of long cables, and should she now be laid up forever, her history will always be connected with that of the most remarkable enterprises ever undertaken and completed. The efficiency of submarine cables, and their immunity from interruption through the effect of atmospheric electricity suggests the expediency of connecting all large sea ports by cables instead of land lines.

The next month, on 25 September 1869, *Scientific American* printed a report, extracted from the *Boston Advertiser*, of the visit of members of the Scientific Association to the cable station at Duxbury, which gives an interesting insight into the workings of the cable [10]:

### Mode of Working the French Cable

A few of the members of the Scientific Association, which closed its session at Salem last week, have been making a visit to Duxbury, the terminus of the newly laid French Cable. What they saw is pleasantly told by the *Boston Advertiser*, from which we make the following extracts:



In an old but well preserved clapboard mansion of that quaint old town were found the headquarters of this new and wonderful highway. The visitors were cordially welcomed by the manager, Mr. Brown, and were at once brought into the presence of the flitting, flame-like image which indicated, in symbols, on a graduated screen, the thoughts working at that instant on the other side of the Atlantic. Interpreting the fitful tremor of the image, or line of light, one inch in length, and one eighth of an inch in breadth, the youthful interpreter, who did not look the wizard that he was, calmly read, for transcription by his assistant, a message in which occurred, at intervals, the words 'New Orleans' - 'Citizens' - etc., etc. While inspecting the apparatus the members of the party received the following message fresh from France, sent expressly to them:

"To Duxbury, from Brest - Time 5:20 P.M [Paris Time]

"The company present their compliments to the gentlemen assembled at Boston, and hope to be able to send them news of the great international boat race that will be gratifying to both nations."

The usual rate of transmission is about ten or twelve words per minute. Looking for the mechanism by which these wonderful results were obtained, the inquiring visitors observed, on their right, placed on a marble pedestal, a medium-sized spool of silk-covered copper wire, said to consist of several thousand turns or convolutions, in the center of which spool, suspended by a single silkworm fiber, was a minute mirror attached to a little magnet made from a piece of watch spring. From a lamp, properly placed and shaded, a beam of light was thrown upon this mirror, and from the mirror was reflected, two hundred times enlarged, upon the graduated screen in front of the interpreter, the flame-like image already mentioned. In transmitting, from Duxbury to Brest, the operator, with his right hand, makes use of two keys or springs, one of which, being pressed, causes, at Brest, a deflection in a similar mirror, sending the image-flame to the right, while pressing the other key deflects the mirror at Brest in the opposite direction, sending the image to the left. Its indications are thus interpreted; a jerk or flitting once to the left and then once to the right denotes the letter a; a flitting once to the right and then three times to the left, denotes the letter b; and thus, letter by letter, the words are spelled.

Passing into an adjoining room the delicate instruments used for testing the electric conduction of the cable are shown among which are condensers and batteries, rheostats and shunts, bridges, switches, and plugs, and, crowning all, the wonderful astatic galvanometer of Sir William Thompson. But possibly it would weary our readers to tell of ohms and megohms, farads and megafarads, volts and microvolts, and all the terminology of conduction, resistance, electrostatic capacity, and continued electrification. It may, however, gratify them to learn that the insulation of the deep-sea cable, between Brest and St. Pierre, has more than doubled in efficacy during the short month which has elapsed since this cable was first committed to the embraces of Old Ocean - as is evinced by the fact that, soon after it was laid, the insulation resistance rose to 2300 megohms, and has since been gradually increasing until it is now 5000 megohms per nautical mile. This improvement in the insulation of the deep-sea cable is believed to be mainly due to the coldness or diminished

temperature to which it is subjected at great ocean depths. The insulation resistance of the portion of the cable connecting Duxbury and St. Pierre is much less, namely, 1500 megohms per nautical mile.

If one would inquire of a cable electrician - what is a megohm? he might, with propriety, be told that it is a million ohms. Should he still further inquire - but what is an ohm? a suitable reply would be, it is the yardstick of the electrician by which he measures the electric condition of conductors, and which may be represented by a round wire of pure copper one-twentieth of an inch in diameter and 240 feet in length, at the temperature of 60 degrees of the Fahrenheit thermometer; while a megohm, by which he measures the resistance of insulators, is a unit, the length of which is a million times as great.



The Duxbury Cable Office on a 1907 postcard.  
Detail of building

#### References:

1. Benjamin, S. G. W: *Along the South Shore*, Harper's new monthly magazine./ Volume 57, Issue 337, June 1878:  
"Duxbury immediately adjoins Kingston, at the head of Plymouth Bay, admirably situated, beyond most towns in New England, in a lovely undulating landscape washed by a beautiful sheet of water. Like almost every town in Massachusetts, it derives its name from a spot in old England endeared to the first settlers by many fond memories.  
"In more recent times Duxbury has been noted for ship-building, and its name has been carried to all parts of the world by some of the finest and fleetest vessels that ever clove the sea waves and defied the storm. In 1869 the landing of the French cable at Duxbury gave the little town a novel interest.  
"Marshfield immediately adjoins Duxbury on the north. It is a straggling township, divided in to Marshfield, Marshfield Centre, East Marshfield, Sea View, Webster Place, Cut River, and Brant Rock, the whole scarcely aggregating two thousand souls. The township was first settled by Edward Winslow the third Governor of Plymouth Colony, in 1632. The place was first called Green Harbor, then Wrexham by the Welsh whom Winslow brought to this country, and eventually Marshfield."

2. Hazewell, C.C.: *The Seventh Decade of the Nineteenth Century*, Harper's new monthly magazine. / Volume 42, Issue 248, January 1871.
3. Bright, Charles: *Submarine Telegraphs, Their History, Construction and Working*, London. 1898.
4. Haigh, K.R.: *Cables and Submarine Cables*, London, 1968, Adlard Coles.
5. Scientific American, New Series, Volume 18, Issue 14, New York, April 4, 1868.
6. Scientific American, New Series, Volume 21, Issue 3, New York, July 17, 1869.
7. Stephenson, Robert Louis: *Memoir of Fleeming Jenkin*, 1887.
8. Smith, Willoughby: *The Rise and Extension of Submarine Telegraphy*, London, 1891, J.S. Virtue & Co. Reprinted New York, 1974, Arno Press.
9. Scientific American, New Series, Volume 21, Issue 6, New York, Aug 7, 1869.
10. Scientific American, New Series, Volume 21, Issue 13, New York, Sept 25, 1869

**See also:**

*The landing of the French Atlantic Cable at Duxbury, Mass.: July, 1869*, Boston, 1869, A. Mudge & Son, Printers.

Hoyt, Franklin Kaye: *The French Atlantic Cable 1869*, Duxbury 1982. Published by the Duxbury Rural & Historical Society and may be ordered through the Society's website. Hoyt's booklet notes that he was given two bound volumes of the corporate records of the Atlantic Telegraph Company of 1856, and the Anglo-American Telegraph Company of 1866, and these volumes are now in the Society's library.

The Society has a museum in the King Caesar House in Duxbury, with a sizeable collection of equipment that was once used in the telegraph office. The museum is open June through August, Wed-Sun 1-4 pm, and during September, Sat-Sun 1-4 p.m.

Mahler, Heinrich: *Das französisch-amerikanische Kabel*, Berlin, 1871, 8vo. 42pp, folding map.

Underwater Cables in the Brest Harbor - a short History of French Trans-Atlantic Telegraph Cables from the French Viewpoint (in English)

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**CABLE WORK**

**1858** Suffolk - Holland

Cromer - Emden

**1859** Cromer - Heligoland

**1861** Algiers - Toulon

Otranto - Corfu

**1866** Irish shore ends of Atlantic cable

Lowestoft - Nordeney section Indo European  
cable

**1869** French Atlantic Cable: St Pierre et

Miquelon - Duxbury

**1870** Carried part of the Red Sea cable for the  
Indo-European cable

Marseilles - Bona

With CS SCANDERIA

**1870** Penang - Singapore